

## PolymerPlace Notes

*A plastics technology newsletter*  
By Margaret Baumann, G.H. Associates

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### WHAT'S NEW AT POLYMERPLACE

It has been several months since we issued our last newsletter. We apologize for the lack of communication. Although the internet has made communication easier it also has made our days busier. We need to bring you up to date so let's get started.

### India May Offer More Opportunities than China Now

By Roger F. Jones –Franklin Management International

*Business Week's Cover Story (August 22/29) was China and India (what you need to know). Reading the article I could not help but think about the tremendous opportunities and obstacles to doing business in China. However at the same time the potential is clearly daunting. The article emphasized China as the manufacturing giant and India as the service giant. However, India does have a significant and growing manufacturing base.*

*Roger Jones (an experienced Plastics Industry executive) has had experience doing business with India and offers the following perspective...*

Many companies, particularly smaller ones, missed the big rush to establish a business in China. By now, it may be too late to “get in on the ground floor.” Take heart – if you waited too long to go to China, you would likely be better off going to India now.

Actually, India has a number of things going for it that make it potentially a better business opportunity than China for the long-term. First is that India’s government is a functioning democracy with a judiciary modeled after Great Britain’s – China is laboring under one of the very few remaining Communist governments, with a weak judiciary that has a reputation for administering justice “unevenly.” Second, India’s economic growth rate is only slightly less than that of China. Third, India has a middle class that is reportedly twice the size of China’s middle class – and, in the absence of the forced birth control policy of China, India’s total population size will overtake that of China within 20 years. Fourth, India has made genuine progress in steadily improving relations with its neighbors, particularly Pakistan, while China is escalating its rhetoric about taking over Taiwan by force.

Doing business in India is not a guarantee to riches, however. Any country with a population of over one billion, with literally dozens of languages spoken and strained relations between half a dozen religious factions, has plenty of problems and opportunities for trouble. There are cultural differences between northern and southern India as well. However, these same problems exist in China – a multiplicity of languages, religions, and cultures. India is more geographically concentrated than China, which makes transportation easier.

An Indian company, The Chatterjee Group, has a substantial minority interest in the recent purchase of Basell, a sign that Indian chemical and plastics companies see their future growth as being in both domestic and overseas trade. India has limited natural resources (other than people and talent!) and will need imported materials with which to make its economy grow.

Some may be waiting for business growth to take off closer to home, in Mexico and Brazil, but these countries have yet not shown the political maturity to trust the private sector to grow their economies. In my opinion, India looks like the place to be doing business for at least the next decade. And that would be true, even if you were already in China.

Note:

*Roger Jones is currently working on a book for the American Chemical Society, tentatively titled “Globalization and the Chemical Industry.” Publication is scheduled for the second quarter of 2006. Additionally, he will be presenting these thoughts and others as an invited speaker at the SPE Europe Thermoforming Conference, Salzburg, Austria, March 17, 2006, in a paper titled “Managing in an Era of Great and Accelerating Change.”*

## Conferences

### Marketing and Management

Maggie Baumann of G.H. Associates (editor of this newsletter) will be participating in two programs on Marketing and Management in the next few weeks. She will be presenting the **“Researching Online” workshop on September 28** at the CDMA (Commercial Development and Marketing Association) Fall meeting held September 27-29, 2005) in Philadelphia (for more info go to [www.cdmaonline.org](http://www.cdmaonline.org)).

She will also participate in the SPE Chicago Section Marketing and Management Day on October 6, 2005.. The day is named **“Management Day of Visions & Solutions: Marketing, Management & Value Seminar**. The meeting is being held at the Wyndham Hotel in Northwest Chicago-O-Hare Airport area. The topics covered include: Competitive and Market intelligence, developing a strong culture of productivity and profit, management issues and balancing work and life responsibilities and how to market to your core strengths. The speakers include: Maggie Baumann of G.H. Associates, Don Delves of the Delves Group, Kathy Schoerder of the Wright Institute and Canright and Paule.

For more information please contact:

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## **Radiation Processing SIG plans conference November 10, 2005 in Philadelphia..**

G.H. Associates (principal in Polymerplace) has been assisting in the start-up of a new Special Interest Group in the SPE (Society of Plastics Engineers). The North American Radiation Processing Special interest group was formed earlier this year and has planned a program for November 10, 2005 in Philadelphia. It will be held at the Embassy Suites Hotel, Philadelphia airport, Philadelphia PA.

The theme of the conference is to demonstrate **electron beam and gamma processing as increasing in its application in the polymer industry**. The conference will include presentations on:

- Radiation Processing Fundamentals
- Principles of radiation processing of polymers
- Polymer property and processing enhancements achievable from radiation processing
- Radiation processing as a key means of improving polyolefin resin properties
- Radiation grafting for new applications
- New advances in radiation processing of polymers in Europe
- A Panel/Round Table discussion with leading experts in this field

**For full conference information and to register, click here (<http://www.4spe.org/conf/0511rad.php>)**

**For Sponsorship opportunities, contact Dave Kerluke, Sponsor and Conference Chair, at 613.841.4205, or email at [dkerluke@sterigenics.com](mailto:dkerluke@sterigenics.com)**

## **POLYMER MARKETS**

### **Building and Construction**

Although it will take some time to re-build, **plastic building products could play a key role after Katrina**. Experts estimate that the total damage from Katrina may be over 100 billion dollars. To start rebuilding, the Federal Emergency Management Agency is planning to purchase the existing stock of manufactured homes, which primarily are made of vinyl siding and shingled roofs. The Manufactured Housing Institute in Arlington, Va. estimates there may be a couple thousand of these homes in inventory.

FEMA is also putting out specifications on the kinds of home that they want the construction industry to build. As many as 10-20 thousand manufactured homes could be needed.

One of the reasons they are looking at manufactured homes is that there may not be enough skilled workers to build homes.

In order to build homes the infrastructure also needs to support it. PVC pipe makers that serve the buried water, sewer, drainage and irrigation pipe markets have just started to assess the need.

Bob Walker, executive director with UniBell PVC Pipe Association in Dallas, said his organization is hopeful that the buried infrastructure still is useful and structurally sound, only requiring cleaning.

Geocell Systems Inc. of San Francisco (we wrote about this company's product in a prior Polymerplace issue) has been contacted by the U.S. Army Corps of Engineers, for use of its Rapid Deployment Flood Wall( RDFW), made from a copolyester sheet. The product can be used in place of sandbags. Geocell;s system can be built in a manner of hours not days. The Geocell product because of its rapid deployment could offer protection for key installations like hospitals and emergency shelters. Something to think about in our continued coastal development.

## Packaging

A few years ago, it was the plastic beer bottle, with its amber color and oxygen-barrier technology that concerned PET recyclers. Now another plastics container is a cause of concern- those made from bio-based materials.

NatureWorks LLC, a wholly owned subsidiary of Cargill Inc., produces polylactic acid using corn sugars. Beverage containers made from the material are recyclable and can be broken down and composted.

But recyclers of PET containers are concerned about contamination issues.

The company is taking steps to alleviate concerns of plastic recyclers. [NatureWorks announced its plans to implement a large-volume buy-back program for its containers](#) at the National Recycling Coalition's Congress & Exposition, held Aug. 28-31 in Minneapolis.

Minnetonka, Minn.-based NatureWorks is working with stakeholders to answer many of the questions surrounding its containers and how they will affect recycling systems. The company has collected and composted more than 1 million pounds and chemically recycled more than 5 million pounds of material, said Brian Glasbrenner, manager of business development for NatureWorks' film and bottles division. Since PLA does not perform well with soda or beer, its primary applications would be bottled water, juice, dairy products and cooking oils.

Products with long shelf life are also not a candidate at this time. Aveda Corporation, e.g. needs three years shelf life and PLA containers have not held up according to John Delfausse, V.P of Packaging.

## Electrical/Electronic

When the VP Plast Company, based in Morteau, France wanted to design a micro-connector capable of withstanding the high temperatures in a lead-free solder bath, they chose VICTREX® PEEK™ as an insulation material because of its high deformation temperature and excellent thermal stability. [VICTREX PEEK enabled VP Plast to meet customer design requirements for a micro-connector](#) that allowed the space between two electronic cards to be reduced while at the same time ensuring good electrical continuity.

According to Andrew Ragan, Product Manager, Victrex USA, "Compared to traditional soldering where fusion temperatures are around 230°C (446°F), lead-free alternatives require an extended wetting time (involving pre-heating and re-fusion) at temperatures that can exceed 260°C (500°F). When faced with such demanding temperatures conditions, most of the polymers traditionally used for electronic components are at the limit of their application range. PBT, Nylons, PPS or LCP either undergo deformation, melt or exhibit inadequate mechanical strength. For these reasons, VP Plast chose glass fiber reinforced VICTREX PEEK since it offers a deformation temperature under load of 315°C (599°F), plus excellent thermal stability." VP Plast initially produced a prototype mold for molding a micro-component in VICTREX PEEK that featured a micro-slot into which an 80µm CuBe contact blade was to manually inserted. After molding several thousand of these components, VP Plast decided to eliminate the manual operation and to automatically over-mold the contact blade using integrated fully automatic micro blanking.

The final challenge was to produce a 4 mm<sup>3</sup> component using a single continuous process from an 80 micron strip by stamping, micro over-molding with VICTREX PEEK bending and final stamping with continuous control and in-process elimination of non-conforming components. "VP Plast developed the 8-cavity mold that was manufactured to the micron level and maintained at a regulated 200°C (392°F) temperature in order to guarantee the good crystallinity of VICTREX PEEK said Ragan. "And, the final tolerances obtained on the molded components were 20 µm."

By using the continuous strip overmolding process, VP Plast was able to remain highly cost-competitive and keep production of the micro-connectors in France. According to VP Plast, the market looks exceedingly promising with sales of several million components being forecast for 2005. For more information on Victrex PEEK please visit <http://www.Victrex.com>

## POLYMER/MATERIAL DEVELOPMENTS

### Research to develop low cost nanoparticles

PPG Industries and the Idaho National Laboratory, a multi-disciplinary laboratory of the U.S. Department of Energy, have agreed to extend their cooperative research-and-development effort by one year. They will continue developing low-cost "nanoparticles" that could be used in a wide range of applications, such as stronger, light-weight body armor for soldiers, light weight structural composites and improved scratch resistance, brighter colors and improved corrosion resistance for paints.

Nanotechnology is the science of engineering with particles of matter that are one-billionth of a meter in size -- or 1,000 times smaller than the diameter of a human hair.

"INL's collaboration with PPG supports President Bush's National Nanotechnology Initiative to facilitate the transfer of new technologies into products for national security, economic growth, jobs and other public benefit," said Sigurd Sorensen, INL manager of industrial technology. "Our national laboratory-private industry partnership has already achieved a great deal, and is an important part of INL's portfolio of industrial, energy and environmental initiatives."

PPG and INL, working together since 2001 to develop low-cost nanoparticles for commercial use, have made significant progress in developing nanoparticles in a small-scale plasma reactor at PPG's Allison Park, Pa., coatings R&D center, according to James A. Trainham, PPG vice president of science and technology. The partners are working to commission a large-scale pilot project in the near future and, ultimately, to create a commercial process for manufacturing materials made of nanoparticles within the next several years, he said.

"We still have much to achieve, but our work with nanotechnology is showing great promise for application in defense and homeland security, as well as many commercial markets," Trainham said. "The bottom line is that nanoparticles can be used to make a wide array of products lighter, stronger and better."

In addition to being used to enhance existing products, Trainham said nanotechnology can also be used to develop entirely new businesses.

"Once commercialized, this technology will provide keen competitive advantages to all who use it," he said. "For PPG, it will impact virtually all of our businesses, from coatings to glass to chemicals and fiber glass."

PPG is already using nanotechnology in a limited number of commercial applications, Trainham said, including the award-winning *CeramiClear* automotive clear coat by PPG that protects vehicles' color coat and is resistant to scratches, mars and acid etch. In addition, nano-structured layers are used in developing *SunClean* self-cleaning glass by PPG, he said.

While the PPG/INL effort centers on creating materials made of nanoparticles, he said, other efforts in the National Nanotechnology Initiative involve the fields of biology, chemistry, mechanical engineering and electronics.

In operation since 1949, the INL is a science-based, applied engineering multi-disciplinary national laboratory dedicated to supporting the U.S. Department of Energy's efforts in nuclear and energy research, science and national defense. For more information, visit [www.inl.gov](http://www.inl.gov).

For more information about PPG, its technologies and the markets it serves, visit [www.ppg.com](http://www.ppg.com).

(*CeramiClear* and *SunClean* are trademarks of PPG.)

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### And yet another type of Polymer/composite enhancement...

An additional method that can improve the performance of conventional polymer alloys/blends is a process that exposes plastic resins, powders or organic reinforcement fibers to reactive gas atmospheres. By exposing polymers and reinforcements to controlled oxidative atmospheres, a wide range of functional chemistries can be grafted onto the material surface. Especially for nonpolar polyolefins, this process provides a cost-effective method

for imparting the interfacial chemistries required for alloying polyolefins with engineering plastics, or for improving the dispersion of reinforcement fibers and additives.

For example, using a small percentage of treated HDPE particles, blends of HDPE and nylon 6 can achieve more than a 200% increase in impact resistance at the same stiffness through the improved dispersion of these two dissimilar polymers.

**Reactive gas modified polyolefin powders** are also useful in thermoset systems. These treated powders disperse evenly into the liquid system and form a strong bond to the matrix when cured. This results in a substantial increase in abrasion resistance, tensile strength, and cut resistance with the added benefit of decreasing the coefficient of friction in certain applications.

Due to the oxidative strength of the gases used in this process, practically any polymer or organic fiber can be modified to introduce functional chemistries. This polymer treatment technology is just beginning to demonstrate the wide range of benefits in thermoset and thermoplastic composites.

For more information on this process and available products, contact:

Kelly Williams  
Business Development Mgr  
513.683.4667

Inhance Fluoro-Seal, Ltd. [www.inhanceproducts.com](http://www.inhanceproducts.com)

## PROCESS/MATERIAL/DESIGN DEVELOPMENTS

### New TPE material for overmolding (soft/rigid)

GLS Corp. has introduced a new thermoplastic elastomer (TPE) i.e. Versaflex® OM9-801N that adheres to almost any rigid plastic material including including ABS, HIPS, PS, PC, ABS/PC, PMMA and HDPE. Most TPE grades that can only be used with just one type of rigid plastic. Versaflex® OM9-801N does not require any drying and it is overmolded at lower pressures and temperatures than conventional TPE grades. In addition it offers high soft touch properties. It can be used for toys, sporting goods, appliances, garden equipment, power and hand tools and so on.

For further information contact: GLS Corporation, Marketing Department, GLS Corporation 833 Ridgeview Drive, McHenry, IL 60050-7050. Telephone: (815) 385-8500 or (800) 457-8777. Fax: (815) 385-8533. E-mail: [info@glscorp.com](mailto:info@glscorp.com) Web: [www.glscorp.com](http://www.glscorp.com).

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### Soft/on Soft for soft touch molding

Efforts by three companies have resulted in the commercialization of an SEBS-based TPE vehicle handle in which a very soft (28 Shore A) surface layer is coinjecting onto a substrate of a firmer 60 Shore A compound. This type of molding offers new design options.

Thermoplastic elastomer is typically coinjecting onto a rigid polypropylene or ABS substrate using twin-shot molding. The arrival of soft-on-soft capability means that designers of soft-touch parts have a broader selection of hardness choices.

The molder of the breakthrough soft-on-soft TPE handle is Slatebond in Corsham, Wiltshire, U.K., which used a pair of Evoprene G compounds from U.S.-based AlphaGary Corp. The compounds were based on Kraton G SEBS resins supplied by Kraton Polymers.. A new-generation grade with enhanced flow properties was used for the super-soft surface layer. Slatebond says it can make parts as soft as 15 Shore A hardness. Previously there were barriers to soft on soft molding. For example the pressure of the injection molding process would deform the soft substrates. In addition adhesion to the substrate was also hard to achieve. The solution involved redesigning the hot runner and gating design and also developing a compound based on a higher flow SEBS resin. The easier flow helped prevent voids at the surface and minimized knit line formation ensuring good adhesion of the layers.

Kraton Polymers anticipates that soft-on-soft molding will catch on rapidly once initial applications prove themselves in the market. Rolf Schrauwen, Kraton's compounding account manager, says target markets include appliances, packaging, sports gear, and auto interior parts. For more information regarding the Evoprene compounds contact Alpha Gary at 800-221-6599. More information on Kraton Polymers can be obtained at 800-457-2866

### The TPE Market Grows up

The TPE Topcon (sponsored by SPE) was held in Akron, Ohio September 11-13 in Akron, Ohio. Global demand for TPEs (Thermoplastic Elastomers) was over 4.2 billion pounds in 2004 with 45 percent in styrenic block copolymers and 35 percent in thermoplastic olefins and vulcanizates. The balance is made up of Thermoplastic urethane (TPU) and engineering TPEs like copolyesters and copolyamides. There is an emerging class of materials based on TPV technology called super-TPVs based on acrylate, nitrile and silicone. These are finding a home by replacing some thermoset rubber in automotive and industrial applications. These materials are being developed and marketed by Dow Corning, Zeon Chemicals LLP, DuPont and Fruedenberg NOK GP. A new material variation coming onto the scene is Styrene Block copolymer based TPVs. These materials have been developed to improve the heat resistance, chemical resistance and compression set of styrenic TPEs. Septon Polymers discussed the benefits of the material at the conference. Nano TPVs are also being introduced. Nano-TPVs can improve scratch and mar resistance in applications such as bumper fascias. Currently the Automotive market makes up the largest demand for TPEs in North America and Europe. This is largely due to the migration of non-automotive use manufacturing like footwear and consumer goods to Asia. The Asian market now makes up about 35-38% of the world demand.

Robert Eller Associates will soon publish their TPE study, entitled: **Specialty Thermoplastic Elastomers...Markets, Economics, Technology and Intermaterials Competition**. For more information please visit [www.robertellerassoc.com](http://www.robertellerassoc.com) or phone: 330-670-9566.

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**References:** The stories in *PolymerPlace Notes* come from a variety of sources including Company Press Releases, Interviews, and trade publications, e.g. *Plastics News* and newswires.

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<http://www.Polymerplace.com>

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